

Chapter 9 · Some Applications of Trigonometry

Part 9 • Spot the Mistake

Each solution below reaches a wrong answer, and exactly one step is to blame. Find the first wrong step and rewrite it correctly. Marking other people's work is the fastest way to stop making their mistakes.

□ Spot the Mistake

Elevation or depression?

Step 1. A person on a cliff looks down at a boat; the angle formed with the horizontal is called the angle of elevation.

Step 2. The angle of elevation of the cliff-top from the boat equals this same angle, since they are alternate angles on the same line of sight.

Step 3. So both angles in this situation are called angles of elevation.

_____ The first wrong step is Step _____. What should it say?

□ Spot the Mistake

Choosing the ratio for a ladder problem

Step 1. A ladder leans against a wall at 60° to the ground; we know the base distance and want the height reached, so we should use $\tan 60^\circ$.

Step 2. $\tan 60^\circ = \frac{\text{height}}{\text{base}}$, so height $\div$ base $\times \tan 60^\circ$.

Step 3. If instead we know the ladder's length (hypotenuse) and want the height, we should still use $\tan$.

_____ The first wrong step is Step _____. What should it say?

□ Spot the Mistake

Adding the observer's height

Step 1. A 1.5 m tall boy sees a balloon at elevation 30° ; the horizontal distance found from $\tan 30^\circ$ is the height of the balloon above the ground.

Step 2. The height found from $\tan 30^\circ$ is only the height of the balloon above the boy's eye level.

Step 3. To get the balloon's height above the ground, we must add the boy's eye height (1.5 m) to that result.

_____ The first wrong step is Step _____. What should it say?

Every skyline, kite string and ladder around you is secretly a right triangle waiting for its angle. You now know exactly which ratio to reach for. ☐☐